Internal Medicine Update USNAC 2015

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Disclosures

- The views expressed in this presentation are those of the author and do not reflect the official policy or position of the U.S. Department of the Navy, U.S. Department of Defense, or the U.S. government.
- No financial, professional, or personal conflict of interest

Objectives

- Apply recent revisions in ARWG to your aeromedical practice
- Evaluate elevated fasting glucose for AMS submission
- Evaluate thrombocytopenia for AMS submission
- Evaluate Prolonged QTc Interval for AMS submission

Outline

- 5.1 Diabetes mellitus/Prediabetes
- Thrombocytopenia
- Prolonged QTc
- 7.10 GERD
- 7.11 Ulcerative Colitis
- 5.5 Male hypogonadism

Categories of Increased Risk for Diabetes

- Impaired Fasting Glucose (IFG)
  - FPG 100-125 mg/mL (5.6-6.9 mmol/L)
- Impaired Glucose Tolerance (IGT)
  - 2-h plasma glucose in75-g OGTT 140-199 mg/dL (7.8-11.0)
- Prediabetes
  - HgbA1c 5.7-6.4%

American Diabetes Association. Diabetes Care 2011;34(Suppl 1);S11-S61.

Significance of Prediabetes

- Not clinical entities
- Risk factors for future diabetes and cardiovascular disease (CVD)
- Strong continuous association between HgbA1c and future diabetes

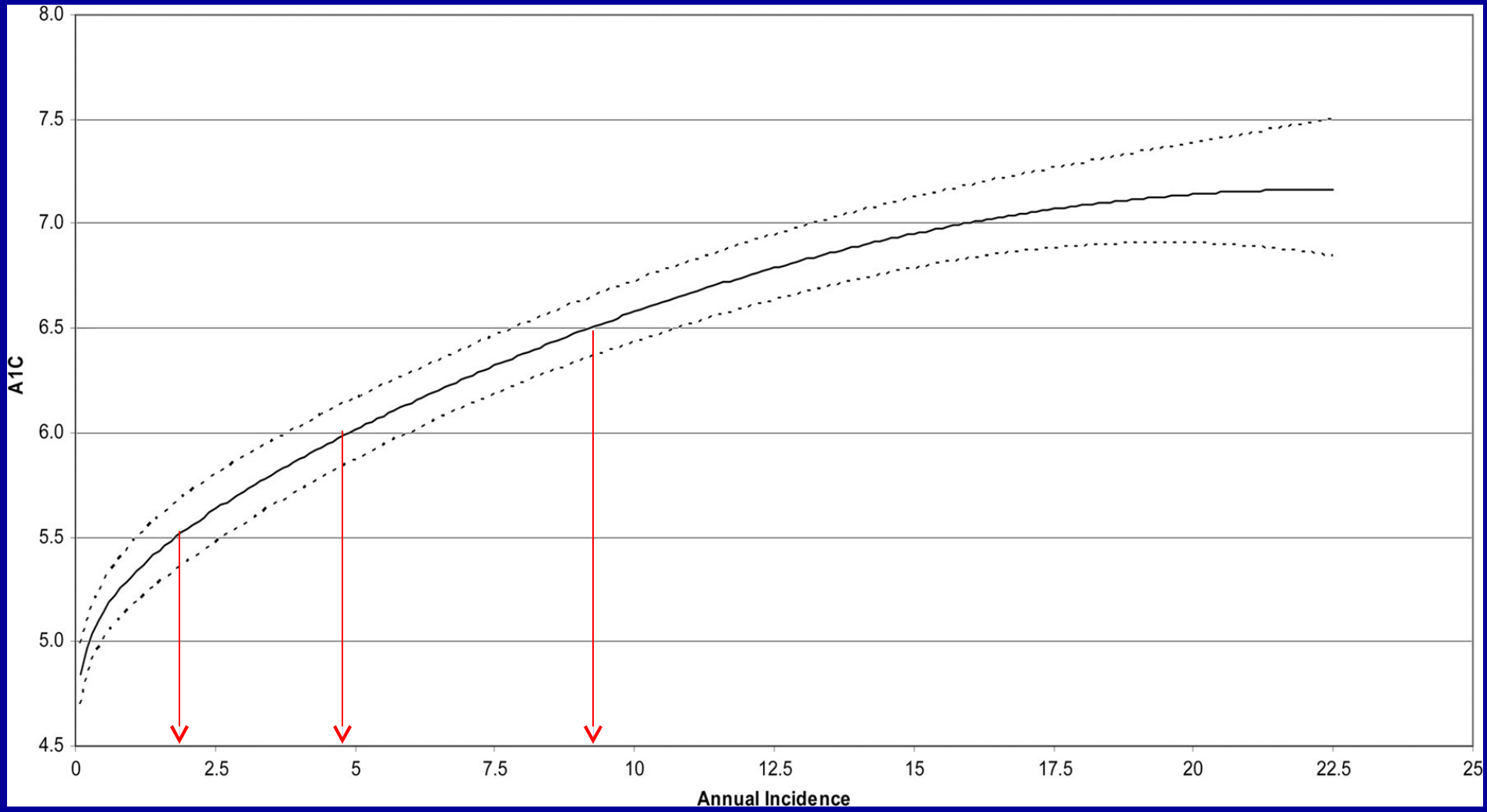
American Diabetes Association. Diabetes Care 2011;34(Suppl 1);S11-S61.

A1c Level and Risk of Diabetes

- Risk of DM increased steeply from A1C 5.0-6.5
- A1C 6.0-6.5%- risk 20 or more times greater than A1C <5.0%
- A1C 5.5-6.0%- risk 5 times greater than A1C <5.0%
- A1C 5.0-5.5%- risk 2 times greater than A1C <5.0%

- Zhang et al. A1C level and future risk of diabetes: a systematic review. Diabetes Care 2010;33;1115-1673.

A1C modeled as a function of annualized incidence.



Zhang X et al. Dia Care 2010;33:1665-1673

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American Diabetes Association.

Waiver Requirements for Prediabetes

- 5.1.1 Dysglycemia- new section separate from Diabetes mellitus
- Aviator does not need to be grounded during evaluation
- Family Medicine or Int Med consult
- Fundoscopic exam
- Nutrition consult
- FBG; HgbA1c < 6.5, TSH, CMP, Lipids, UA, Urine microalbumin:urine creatinine ratio (<300)

Impact on Workload

	JUL 2013-MAR 2014	APR 2014- JAN 2015
NAMI IM Consults	0	4
NAMI IM Clinical Advisories	1	16

Thrombocytopenia

- ARWG pending
- Platelet count less than 150K- CD
- Waiver recommended-
  - Stable platelet count 100-150K
  - Negative lab and imaging work-up
- Hematology consult-
  - Platelet count less than 100K

Thrombocytopenia Eval

- CBC, UA, CMP, LDH
- B12, Folate, Iron, Ferritin
- TSH
- HIV Ab, HBsAg, HCV Ab; H pylori Ab
- CXR PA/Lat
- US spleen/liver

Prolonged QTc

- ARWG pending
- QT interval- measurement
  - Varies with heart rate
  - Shortens with fast HR
  - Lengthens with slow HR
- QTc- Corrected QT interval

Aeromedical Concerns of Prolonged QTc

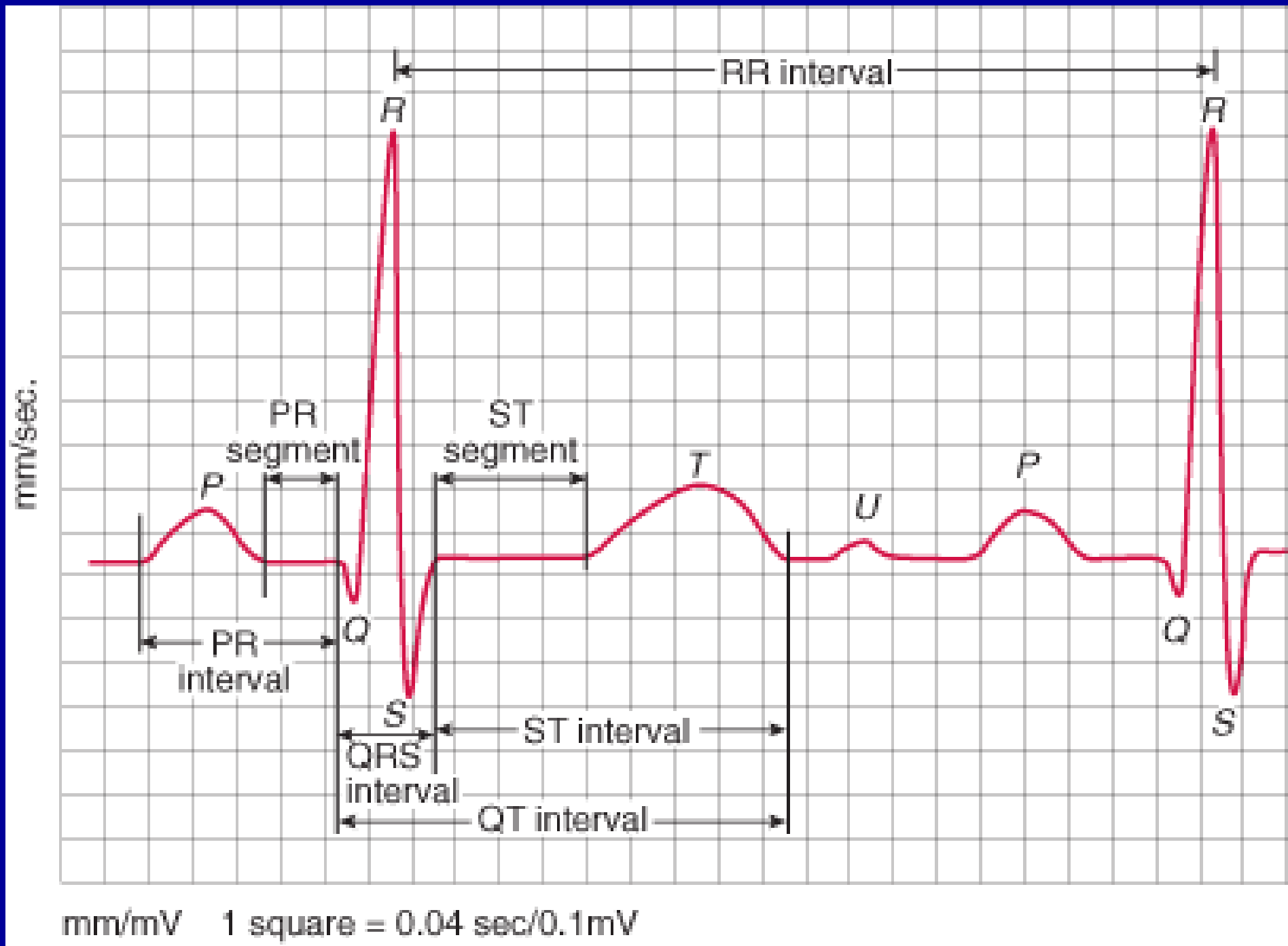
- Syncope, ventricular tachycardia, sudden cardiac death
- Medications
- Hypocalcemia
- Hypothyroidism
- Congenital Long QT Syndrome (LQTS)

Medications- Prolonged QT

- https://www.crediblemeds.org/
- Anti-arrhythmics
- Anti-microbials- macrolides, fluoroquinolones, cholorquine, methadone
- Anti-psychotics
- Anti-depressants- SSRI,

Congenital LQTS

- Syncope and cardiac arrest in childhood and teenagers
- Rapid, polymorphic v tach
- Over 300 mutations in 7 genes accounting for 70% of patients with LQTS
- Genetic testing
  - 5 cardiac ion channel genes
  - Sensitivity 70%


RR interval
R
R
PR
segment
ST
segment
P
T
U
P
PR
interval
Q
Q
S
S
ST interval
QRS
interval
QT interval
mm/sec.
mm/mV
1 square = 0.04 sec/0.1mV

Corrected QT (QTc)

- Bazette's formula
- QTc = QT (sec)/ square root of RR (sec)
- Ex- QTc = .400 sec/ square root of 1.0 sec = .400 sec
- http://www.medcalc.com/qtc.html
- http://www.mdcalc.com/corrected-qt-interval-qtc/
- http://en.ecgpedia.org/wiki/QTc_Calculator

Measurement of QT/QTc

- ECG computer
  - Often artificially prolonged QT- tail of T wave
- Manual measurement of QT
  - Draw slope of T wave on paper
  - Mark where T slope crosses isolectric point
  - Manually measure QT interval and insert in calculator

Proposed Prolonged QT Interval Policy

- Manual QTc <440 msec males (<460 females)- NCD
- Manual QTc 440-459 msec males (460-479 msec females)- CD, Waiver considered. Worksheet.
- Manual QTc 460-499 msec males (480-499 msec females)- CD, Waiver considered. Worksheet, EST, Cardiology
- Manual QTc ≥500 msec males (≥500 msec females)- CD, Waiver not considered

Prolonged QT Interval Worksheet

- Personal History (present or past history)
  - Yes___No___Palpitations
  - Yes___No___Presyncope
  - Yes___No___Syncope (with stress)
  - Yes___No___Syncope (without stress)
  - Yes___No___Cardiac Arrest
  - Yes___No___Long QT Syndrome

Prolonged QT Interval Worksheet

- Yes___No___Medications (prescription/OTC/supplements) (list)
  - _____
  - _____
  - _____
- Family History
  - Yes___No___Unexplained sudden cardiac death (any first degree relative prior to the age of 30 without antecedent trauma or prolonged illness)
  - Yes___No___Long QT Syndrome
- Obtain EST and Cardiology Consult if Personal

Prolonged QT Interval Worksheet

- Lab- K^{+}, Ca^{2+}, TSH
- Supine and Standing (30 seconds after standing from supine) 12 Lead Electrocardiograms

Date	Type ECG	HR	QT (msec) (computer)	QTc (computer)	Manual QT	Manual RR	Manual QTc
	Initial Screening						
	Supine						
	Standing						

Questions